

**AMENDMENT TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

Please amend the claims as follows:

Claim 1 (Currently Amended). A plasma-assisted deposition method for forming an insulating film on a substrate placed on a support device in an airtight processing vessel by activating  $C_5F_8$  gas by a plasma forming gas, the method using a plasma-assisted deposition system and comprising:

~~radiating a microwave from a plurality of slots in a circumferential arrangement in a flat antenna member disposed opposite to the support device;~~

guiding ~~[[the]]~~a microwave guided by a wave guide ~~into the airtight processing vessel to a flat antenna member disposed opposite to the support device;~~

radiating the microwave from a plurality of slots in a circumferential arrangement in the flat antenna member;

supplying the plasma forming gas, including a rare gas, into the airtight processing vessel with a plasma forming gas discharge head disposed between the flat antenna member and the support device;

supplying the  $C_5F_8$  gas into the airtight processing vessel with a  $C_5F_8$  gas discharge head disposed between the plasma forming gas discharge head and the support device, while conducting the plasma forming gas vertically through a plurality of through holes in the  $C_5F_8$  gas discharge head;

providing an electron temperature of 2 eV or below and an electron density of  $5 \times 10^{11}$  electrons per cubic centimeter or above in a space extending between  $C_5F_8$  gas supply openings in the  $C_5F_8$  gas discharge head and a surface of the substrate;

providing a processing atmosphere pressure of 19.95 Pa or below; and

depositing on the substrate the insulating film which is a fluorine-containing carbon film having a relative dielectric constant of 2.3 or below and a leakage current of  $5 \times 10^{-8}$  A/cm<sup>2</sup> or below.

Claim 2 (Cancelled)

Claim 3 (Previously Presented). The plasma-assisted deposition method according to claim 1, wherein the slots have a length between half the wavelength of the microwave at the side of the waveguide with respect to the flat antenna member and half the wavelength of the microwave at the side of the plasma producing space with respect to the flat antenna member.

Claim 4 (Previously Presented). The plasma-assisted deposition method according to claim 1, wherein the plurality of slots are arranged on concentric circles having their centers at the center of the flat antenna member or on a spiral around the center of the flat antenna member.

Claim 5 (Previously Presented). The plasma-assisted deposition method according to claim 1, wherein the microwave radiated from the flat antenna member is a circularly polarized wave or a linearly polarized wave.

Claims 6-8 (Cancelled)

Claim 9 (Withdrawn). A plasma-assisted deposition system comprising:

an airtight processing vessel internally provided with a support device for supporting a substrate thereon;

a C<sub>5</sub>F<sub>8</sub> gas supply system for supplying C<sub>5</sub>F<sub>8</sub> gas for forming an insulating film on the substrate into the processing vessel;

a microwave generator for generating a microwave for activating the C<sub>5</sub>F<sub>8</sub> gas to produce a plasma;

a waveguide for guiding the microwave generated by the microwave generator into the processing vessel; and

a flat antenna member connected to the waveguide, disposed opposite to the support device and provided with a plurality of slots formed therein in a circumferential arrangement;

characterized in that  $C_5F_8$  gas is activated by the plasma, a space extending between  $C_5F_8$  gas supply openings and a surface of the substrate has an electron temperature of 2 eV or below and an electron density of  $5 \times 10^{11}$  electrons per cubic centimeter or above, a processing atmosphere has a process pressure of 19.95 Pa or below, and a fluorine-containing carbon film deposited by a film deposition process on the substrate placed on the support device has a relative dielectric constant of 2.3 or below and permits a leakage current of  $5 \times 10^{-8}$  A/cm<sup>2</sup> or below.

Claim 10 (Withdrawn). The plasma-assisted deposition method according to claim 9, wherein the slots have a length between half the wavelength of the microwave at the side of the waveguide with respect to the flat antenna member and half the wavelength of the microwave at the side of the plasma producing space with respect to the flat antenna member.

Claim 11 (Withdrawn). The plasma-assisted deposition system according to claim 10, wherein the plurality of slots are arranged on concentric circles having their centers at the center of the flat antenna member or on a spiral around the center of the flat antenna member.

Claim 12 (Withdrawn). The plasma-assisted deposition system according to any one of claims 9 to 11, wherein the microwave radiated from the flat antenna member is a circularly polarized wave or a linearly polarized wave.

Claims 13-14 (Canceled)